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DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XIX September 15, 1935 Number 15

A TOBACCO DISEASE SURVEY IN TENNESSEE AND KENTUCKY

Paul R. Miller

This survey was made in upper East Tennessee (the Greeneville section, air-cured Burley), Middle Tennessee (Carthage, air-cured Burley; Springfield and Clarksville, dark fire-cured type), and in Western Kentucky where the dark fired type predominates.

Greeneville section: Counts were made in 22 fields of Greene County which grows approximately 7,000 acres and which was thought to be more or less representative of this tobacco-growing region. Black root rot, Thielavia basicola, was found generally in all fields even though the growers are resorting in many cases to resistant strains. The number of infected plants varied from 1 to 15 per cent with an average of about 4 per cent. Mosaic (virus) in the same 22 fields ranged from none to 100 per cent with an average of about 20 per cent. Frog-eye, Cercospora nicotianae, was abundant on the lower leaves of 3 two-acre fields and was found in scattered amounts in the others. Black fire, Bacterium angulatum, was observed in only 2 of the 22 fields, while wildfire, Bacterium tabacum, was not seen. Firing, (non-parasitic) was very severe in 9 fields. In some cases this injury included the entire plant. It was much more noticeable on the lighter soil. Leaf scald (non-parasitic) was severe in 7 of the 22 fields visited.

Middle Tennessee: Frog-eye, Cercospora nicotianae, and mosaic, although generally found in scattered amounts, seemed to be less prevalent than in East Tennessee. Black fire was severe in one three-acre field. Other than this it was found only in small amounts. Frenching (undetermined) affected 20 per cent of the plants in a two-acre field severely. Not all of the diseased plants were in the lower soggy soil, but some were on the knolls. Wilt, Fusarium nicotianae, was found on about 20 per cent of the plants in a one-acre field of one-sucker tobacco near Springfield. A wilt caused by an undetermined organism was found in several areas totaling about one acre in an eighteen-acre field of dark fired tobacco near Adams, Tennessee. These infected areas were somewhat lower than the surrounding portions of the field, and it appeared that water from the upland had rushed through them during the heavy rain.

Western Kentucky: Black fire was very severe in 3 large fields near Guthrie, Kentucky, and in 4 near Hopkinsville. The infection was perceptibly worse on the northwest side of the plants. Some portions of these fields were so severely damaged that it is doubtful whether they will be harvested. Drouth spot may have been associated with this injury. Wildfire was generally observed in small amounts throughout this section. Many fields showed large areas of dead leaf surface--drouth spot? In some cases the centers of these spots showed frog-eye and possibly Alternaria sp. and Macrosporium sp. while in others there seemed to be no organism involved. Firing on Burley tobacco near Hopkinsville was severe. In some cases the growers were trying to save the lower leaves by harvesting prematurely.

DISEASE SURVEY NOTES FOR AUGUST IN MASSACHUSETTS

O. C. Boyd

Because of the abnormally dry weather throughout August, plant diseases of all kinds made little headway in Massachusetts during the month. Some exceptions are indicated below. Only about nine-tenths of an inch of rain fell at the Amherst weather station. Precipitation in July, also, was considerably under normal. The eastern half of the state fared somewhat better with an additional one-to-two inches of rainfall during a downpour on August 22. This rain, although too late for many crops, was very helpful for fall seeding of spinach and for late crops of tomatoes, beans, cauliflower and cabbage.

Bean rust (Uromyces phascoli) began to appear generally during the latter part of July, but was held to a standstill during August by the dry weather. Likewise, anthracnose of cucumber and cantaloupe (Colletotrichum lagenarium) which was unusually conspicuous during the latter half of July, made little progress during

August. The leaf blights of carrot (Macrosporium carotae and Cercospora carotae), which secured a vigorous start during the wet weather earlier in the season, continued to spread on many farms during the month, causing at least 50 per cent loss from defoliation in no few instances. Such losses were observed in the Connecticut Valley and in Bristol County. The same was true of early blight of tomatoes (Alternaria solani) in many of the early settings. Apparently the damp nights, from fogs and heavy dews, proved favorable for their development in spite of the drought.

Late blight of tomato (Phytophthora infestans). County Agent Charles Harris of Bristol County reported that it appeared unusually early in that County this summer; in fact, on July 25. Mr. Harris and a few of his growers observed the disease on a few scattered plants in the early settings, but stated that it failed to spread any further during late July and August. When I visited the fields on August 23, no leaf infection could be found, but old infected fruits that had been thrown into the roadways verified their diagnosis. In the same county, late blight was observed by Mr. Harris on potatoes during the potato tour on July 13. The unusually early appearance of this disease on these crops was apparently associated with the excessively wet weather during May, June, and the first half of July.

On August 23, County Agent Harris of Bristol County and I obtained further evidence of field carryover of this disease on tomatoes. (See Phytopath. 25: 7, 1935). At the farm of Dutra Bros. in Dighton, Manuel Dutra informed us that during July late blight appeared on 3 or 4 scattered plants of his early crop in the same part of the field where a few tomato plants were set out late last summer along with a late setting of cabbage. The disease was common last year in Dighton on late tomatoes. His diagnosis of the disease this summer was correct, as evidenced by several old fruits left in the field that showed typical symptoms. The disease had not spread further this season due to dry weather. Mr. Dutra said that it was not observed in any other part of that field, or in nearby plantings where tomatoes were not grown last year. He reported, furthermore, that both tomato and summer squash seeds very commonly overwinter in his fields and produce volunteer plants the next spring. This, he stated, was particularly true where cull tomatoes were either dumped on the ground or spread out in the field and plowed under.

Might not infected seeds that survive the winter either in the field or in cull piles on the farm, and that germinate the following spring, be a probable source of late blight in tomatoes? If so, would the seeds be more likely to be rendered non-viable if left on the surface of the soil during winter or plowed under in the fall? If others have information on this phase of the life history of Phytophthora infestans, I should like to be informed of it.

The yellow leaf rust of raspberries (Pucciniastrum americanum) that was so widespread in the state in 1933, was observed recently in Amherst, but the damage was very slight and limited to only a few varieties. Since the infection was on rather old leaves, it apparently became started before the August drought set in. No recent spread had occurred.

Although apple scab (Venturia inaequalis) made little headway during the month, due to dry weather, sufficient damage was done during the rainy spring and early summer to both foliage and fruit, that considerable loss in grade of fruit is now being experienced during the harvest of McIntosh. No matter how rainy the season, the top-layer of apple growers, who are in the habit of doing a thorough job of spraying along with attempting to time their sprays properly, arrive at harvest, year in and year out, with a clean crop of fruit--clean from both scab and insect pests. It is believed that the lack of thoroughness in spraying is more outstanding than any other factor in the failure to control properly scab and other apple diseases in this State. A rainy spring and early summer certainly bring out results of the moderate or average job of spraying for scab as compared with the comparatively few thorough jobs.

The bacterial leaf spot or blight of Iris (cause undetermined) that was first observed in Massachusetts in 1931, made pronounced headway in the college gardens during spring and early summer, but became arrested during August. On the Cape, however, where the weather was no doubt damper, the disease appeared to have fared rather well during the month, killing the tops completely in some beds. This disease appears not to injure the rhizomes to anything like the extent that it does the tops. (Sept. 6).

VEGETABLE DISEASES IN OHIO

J. D. Wilson

Diseases of vegetables are more varied and, in many instances, more severe in Ohio than they have been at any time during the past nine years. This condition is largely due to the frequency and severity of showers which have occurred since July 4. During the six-week period following this date the total precipitation was 17 inches or approximately three times the normal. Rain fell on 21 of the 42 days, and floods occurred at times. Many of the nights were extremely warm and humid.

At least three diseases have been very severe, namely, early blight of tomato (Alternaria solani) which has caused a large loss of yield on the upper fruit clusters, and, in some instances, has appeared as a stem-end rot of the fruit; early blight of celery

(Cercospora apii) has caused the abandonment of whole or parts of many fields and large reductions in yield in many more; and finally onion scald (caused by heavy rains followed by hot weather) acted to ripen the crop about two weeks ahead of normal maturity with the result that yields were reduced 33 to 50 per cent.

A large number of diseases have been observed in many fields and gardens, but have not caused major losses in most instances. Included in this group are: a leaf blight of pepper (possibly due to Cercospora capsici) has caused a defoliation so severe that fruit failed to set in many instances; bacterial blight of beans (chiefly Bacterium phaseoli) has caused losses running as high as 60 to 70 per cent in some varieties; leaf spot of beets (Cercospora beticola) has attacked isolated lots of beets and mangels so severely that leaf areas have been reduced by more than half; black rot of cabbage (Bacterium campestre) has been more common than usual and has reduced yields considerably in some instances; Cercospora leaf blight of carrots (Cercospora carotae) has caused some loss, becoming quite severe during the last few weeks; Macrosporium leaf-spot of cucumbers and muskmelons (Macrosporium cucumerinum) has caused consequential losses where it was not checked by spraying; and lettuce drop (Sclerotinia spp.) has been commonly observed in low-lying fields since early August. (Sept. 3)

VEGETABLE DISEASES IN VIRGINIA

H. T. Cook

TOMATO: Bacterial canker (Aplanobacter michiganense) has been widely distributed in Virginia this year and has caused considerable damage in some fields. Mr. L. B. Kietrick informs me that he found bacterial canker in eighteen tomato fields in Westmoreland, Lancaster, Middlesex, Richmond, and Essex counties. The percentage of plants affected with the disease ranged from 1/2 per cent to as high as 30 per cent. I examined one field in Westmoreland County which had been abandoned because of the damage done by bacterial canker. I also found the disease widespread in King and Queen County. The disease was found in plants grown from seed from several seed companies, but was most common and destructive in those from one company.

Bacterial spot (Bacterium vesicatorium) is prevalent in the tomato fields of Lancaster, Westmoreland, and King and Queen counties where it is causing considerable defoliation. Very little spotting of the fruit has been noticed and the disease is not as destructive as last year.

Fusarium wilt (Fusarium lycopersici) is becoming more destructive in Middlesex, Lancaster, and Westmoreland counties. Only wilt resistant varieties can be grown now in fifty per cent of the fields and the various commercial strains of Marglobe frequently show from 46 to 70 per cent infected plants and from 0 to 17 per cent dead of wilt.

Southern wilt (Sclerotium rolfsii) was found causing the death of 28 per cent of full grown tomato plants in one field in King and Queen County.

SPINACH: Seed and seedling decay (Pythium sp.). The practice of treating spinach seed has saved the growers in the Norfolk-Portsmouth trucking area from losing their early planting. Nearly all of the seed planted in this section was treated with Vasco 4, and good commercial stands were obtained. The only grower who did not use treated seed reported a complete failure to get a stand. A test plat at the Experiment Station showed that treating the spinach seed resulted in an increase in stand over the check of 588 to 1375 per cent. (August 15)

REPORTS ON TOMATO DISEASES

SPOTTED WILT OF TOMATOES AND PEPPERS IN NEW YORK: Spotted wilt of tomatoes was recognized for the first time in New York State this summer. Several specimens of affected fruits were received from a grower at Clay, Onondaga County, New York, and were submitted to Professor Max Gardner for verification. He reported that the symptoms were typical for the spotted wilt with which he is working.

A large ring-spotting of pepper fruits and leaves, especially in the variety California Wonder, has been found for two consecutive years on farms in Schenectady County. The rings on peppers strongly resemble those on tomatoes affected with the spotted-wilt disease. Needle-prick inoculations of young pepper plants with ring-spotted pepper leaves produced marked dwarfing of the pepper plants together with considerable mottling and slight deformation of the leaves. Needle prick inoculations on leaves with juice from affected pepper fruits failed to produce infection. (P. P. Pirone, September)

BACTERIAL CANKER IN VIRGINIA: Report of the occurrence of bacterial cancer (Aplanobacter michiganense) disease of tomatoes was confirmed from Bedford County. This disease was found for the first time on four farms in the western end of Bedford County, or at Shady Grove, between Union and Stewartsville and very close to the Roanoke County line. (James Godkin, Sept. 13.)

DOWNY MILDEW OF ONION IN OREGON

In response to the request for information on the occurrence of downy mildew (Peronospora destructor) on onion this year (August 15 issue, page 224), C. E. Owens sends the following note:

> "I have observed none in Oregon during the present summer. Last year the disease was very severe on plantings grown for seed in the Willamette Valley. The difference is apparently due to difference in weather conditions, there being considerable rain during early summer last year and practically none this year."

Reports from other States will be appreciated.

CITRUS CANKER IN TEXAS

The following reports on the occurrence of citrus canker (Bacterium citri) in Texas are quoted from the News Letter of the Bureau of Entomology and Plant Quarantine.

Citrus canker infections were recently found on seven properties, including one abandoned nursery containing 3,500 Citrus trifoliata in a locality about 3 miles southeast of Alvin. More trees of this species were found in the vicinity of Alvin than in any other area in Galveston and Brazoria Counties. All the infected trees, as well as all other citrus on the properties concerned, were destroyed with the assistance of laborers paid by the State. Rapidly spreading infections on small seedlings in this locality indicate that the present season has been unusually favorable for the development of the disease. (Vol. 2, No. 8, p. 22, June, 1935)

Federal and State inspectors working cooperatively recently found citrus canker in the southern part of Harris County, Tex., bordering on the Galveston area, where the disease has been reported on several properties. Citrus trifoliata is scattered throughout the Harris County area in hedges or abandoned nursery stock, and it was on a hedge that the disease was found. Owners in this area are readily consenting to the destruction of such trees. Harris County is one of the 21 counties in Texas once known to be infected with the disease.

Continued inspection in the commercial citrus-growing area of the lower Rio Grande Valley has failed to disclose any citrus canker in this area. (Vol. 2, No. 9, p. 20, July, 1935)

PHONY PEACH DISEASE FOUND IN MARYLAND AND KENTUCKY

A note in the News Letter of the Bureau of Entomology and Plant Quarantine for July, 1935, (vol. 2, no. 9, p. 20), reported that in Maryland two trees infected with phony peach were found in Washington County; and in Kentucky two were found in Henderson County and one in Webster County, during the recent survey of peach-growing areas in these States.

DIPLODIA GRAMINEA SACC. IN SOUTH CAROLINA

William W. Diehl

A specimen of Cynodon dactylon from Union County, South Carolina, August, 1935, submitted by D. B. Rosenkrans bears a fungus on the leaf sheaths which is referred tentatively to Diplodina graminea Sacc., a little known fungus originally described as Diplodia graminea Sacc. (Michelia II, p. 267, 1881) from Italy and not known hitherto from the United States. Saccardo recorded the pycnidia as on culms bearing pycnospores 15-16 x 5-7u whereas the South Carolina specimen has spores slightly smaller, 11-13 x 4-5u. No European specimens are available for comparison and it seems best to regard this fungus as the Italian species until more significant evidence to the contrary is available. It is not unlikely that an intensive study of this organism might show it to be the same as some species of Ascochyta recorded for other grasses.

OCCURRENCE OF FUSARIUM WILT OF CHINA ASTER IN OREGON

Frank P. McWhorter

During the past five years we have received specimens from various Oregon sources, accompanied by letters suggesting that the trouble is aster wilt due to Fusarium. Careful examination has shown so far that in every instance a virus disease of the killing type had been confused with aster wilt. During the last few days, Mr. Leroy Weaver has collected in a home garden in Corvallis specimens of an aster disease which on laboratory test proved to be a true fusarium aster wilt similar to the type which develops under eastern conditions. This record would seem to be important, since we have heretofore advised growers against the use of wilt-resistant varieties because experience had shown that the disease which they were combatting was a virus disease and not the true aster wilt.

The fact that this has been an unusually warm summer may explain the discovery of the disease this year. The spring weather during which asters make their early growth usually maintains such a low soil temperature that outbreaks of fusarium wilt are largely circumvented.

DUTCH ELM DISEASE ERADICATION

Reports from the Bureau of Entomology and Plant Quarantine for the weeks ending August 24 and 31 and September 7 are summarized as follows.

The diseased area in New Jersey was extended 2-1/2 miles west in Hunterdon County by the confirmation of the first tree found to be diseased in this County, near Oldwick, and 3 miles to the northwest in Sussex County by a tree in Sparta Township. A confirmed tree near Milltown, Putnam County, extended the infected zone in New York and also added to the ten-mile protective zone in Connecticut. There has been no increase in the known diseased area in Connecticut this year.

There were no confirmations in other areas during this period.

Diseased trees at this time have lost all external evidences of the Dutch elm disease, other than the type of yellowing that is normal at this season and very recent wilting caused by the disease. All brown and previously wilted leaves were blown off during storms in the last week.

Field observations on confirmed English elms in Nassau County, New York, indicate a masking of the external symptoms of the disease in this species. External symptoms appear as a small amount of leaf drop and a very limited yellowing. Internal symptoms are marked and typical, however.

Clean-cutting in the Great Piece Meadows in Essex County, New Jersey, was started August 5. Since that time, 1,891 trees have been eradicated. Of this number, 107 have been confirmed by laboratory culturing as infected with the Dutch elm disease. This 5.6 per cent of confirmed trees was not determined from foliage conditions but the trees were detected as diseased in the course of tree removal.

The number of confirmed and eradicated trees up to September 7 is as follows:

	Confirmed	Removed
Connecticut		
August 18 to September 7	15	14
Total up to September 7	120	115
New Jersey		
August 18 to September 7	1,187	783
Total up to September 7	8,181	7,062
New York		
August 18 to September 7	509	345
Total up to September 7	4,563	4,232

Other		
August 18 to September 7	0	6
Total up to September 7	14	11
Totals		
August 18 to September 7	1,711	1,148
Total up to September 7	12,878	11,420

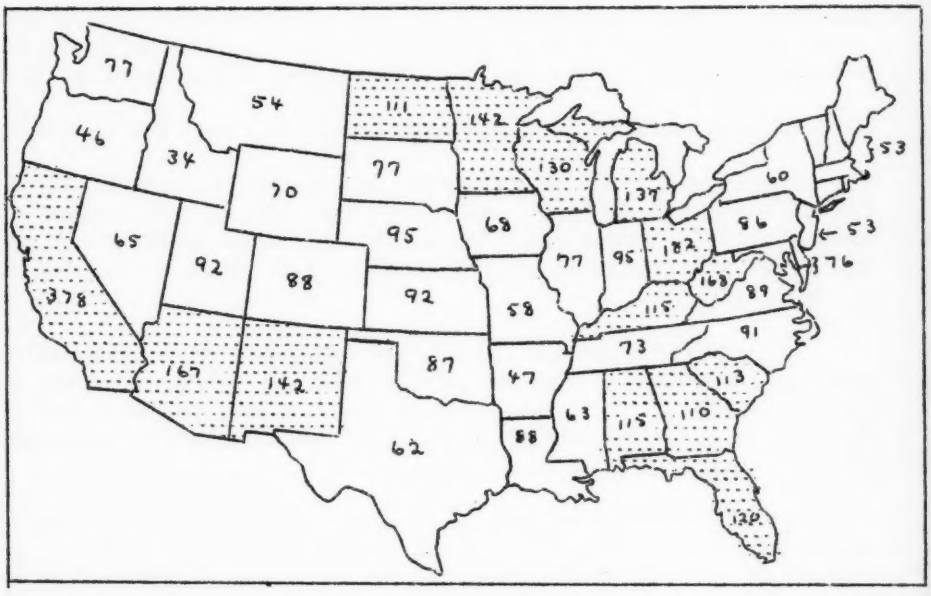

Figure 53. Percentage of normal precipitation by States for August, 1935. Shaded, above normal. (From Weekly Weather and Crop Bulletin, week ending Sept. 10).

AUGUST WEATHER

The weather continued warm and dry over most of the country in August. Temperatures averaged from 4° to 5° above the seasonal average in the Great Plains area and adjacent sections, and it was also considerably warmer than normal in parts of the Southwest and the Great Basin according to the U. S. Weather Bureau Weekly Weather and Crop Bulletin (week ending Sept. 3).

The percentage of normal precipitation by States for August is shown in Figure 53. This map shows that rainfall was above normal in the Southeast, the eastern Ohio Valley, the North-Central States, and the Southwest. In these areas the amounts for the month were well above normal, averaging from 30 to over 80 per cent in the northern section and from 40 per cent to well over three times the normal in the Southwest. Rainfall was markedly deficient in the Northeast, ranging from 40 to 47 per cent below the usual amount, while in the central valleys less than half was received in places. The Northwest continued dry, with Idaho reporting only 34 per cent of the normal August precipitation. (From Weekly Weather and Crop Bulletin, week ending Sept. 10)